

REMARKS

Claims 1, 4-6 and 8-10 are pending in this application. By this Amendment, claims 1, 8 and 10 are amended. Support for the amendments to claims 1, 8 and 10 can be found, for example, in original claim 2. No new matter is added. Reconsideration of this application in view of the above amendments and the following remarks is respectfully requested.

Entry of the amendments is proper under 37 CFR §1.116 because the amendments: (a) place the application in condition for allowance for the reasons discussed herein; (b) do not raise any new issue requiring further search and/or consideration as the amendments amplify issues previously discussed throughout prosecution; and (c) place the application in better form for appeal, should an appeal be necessary. The amendments are necessary and were not earlier presented because they are made in response to arguments raised in the final rejection. Entry of the amendments is thus respectfully requested.

The Office Action rejects claims 1, 2, 4-6 and 8-10¹ under 35 U.S.C. §103(a) over U.S. Patent Application Publication No. 2002/0094469 A1 to Yoshizumi et al. (Yoshizumi), in view of U.S. Patent Application Publication No. 2003/0077488 A1 to Yamamoto et al. (Yamamoto). The rejection is respectfully traversed.

The combination of Yoshizumi and Yamamoto would not have rendered obvious a fuel cell system having an abnormality detection means for detecting an operation abnormality of a purge valve ... the operation abnormality of the purge valve is detected when a discharge quantity of the fuel gas discharged from the purge valve becomes larger than a predetermined quantity, as recited in independent claim 1 and similarly recited in the method steps of claims 8 and 10.

¹ Based on the remarks in the Office Action, and because claim 3 is canceled, it is believed that both §103(a) rejections reject claims 1, 2, 4-6 and 8-10.

Yoshizumi discloses a fuel cell system in which hydrogen-off gas is discharged from a fuel cell via a hydrogen-off gas exhaust flow passage 407 (see Fig. 7 and Abstract).

Yoshizumi discloses that the exhaust flow passage 407 has a shut valve 414 and a hydrogen diluter 424 (see Fig. 7 and paragraph [0098]). The Office Action asserts that the shut valve 414 and the diluter 424 correspond to the claimed purge valve and diluting device, respectively. Further, the Office Action cites paragraph [0130] of Yoshizumi as allegedly disclosing the claimed abnormality detection means. Yoshizumi discloses in paragraph [0130] that valves 418 and 422 are controlled in response to an abnormal situation such as malfunction of the pressure-reducing valves 418 and 422. This is accomplished by the use of relief flow passages 430 and 409, which exhaust the gas to prevent pressure build up do to an abnormality in pressure reducing valves 418 and 422. However, Yoshizumi does not disclose that a purge operation is performed as a result of detecting an abnormality in shut valve 414. Rather, Yoshizumi discloses that a control portion 50 controls shut valve 414 to open and shut at regular intervals to discharge part of the circulating hydrogen gas impurities (see paragraph [0120]). Thus, the purging through shut valve 414 occurs during the normal operation of the fuel cell system of Yoshizumi. Further, Yoshizumi discloses detecting the pressure in a main passage 401. That is, the valves detected in Yoshizumi are the valves 418 or 422 that are mounted in the main flow passage 401, not the purge valve 414.

Yamamoto fails to overcome the deficiencies of Yoshizumi because the purge operation in Yamamoto is not performed as a result of detecting an abnormality in the purge valve 43. Rather, Yamamoto teaches that the ejector and hydrogen pump require purging and that purging occurs during the normal operation of the fuel cell system of Yamamoto (see paragraphs [0002]-[0005]). Therefore, the purging and dilution with air in Yamamoto is not performed due to detecting an abnormality in a purge valve.

Further, the Office Action acknowledges that "Yoshizumi fails to teach an oxidant line that bypasses the fuel cell in order to provide oxidizing gas supply to change the purged gas under an abnormal detection" (see page 3 of the Office Action). The Office Action cites Yamamoto as allegedly overcoming the deficiency. Although Yamamoto discloses providing air to discharged fuel diluter 44 (see Fig. 8), one of ordinary skill in the art would not have predictably modified Yoshizumi with the teachings of Yamamoto in the manner proposed by the Office Action. In particular, Yoshizumi discloses introducing oxygen-off gas into the hydrogen diluter 424 through a flow passage branching off from a location upstream of a muffler 522 and that merges downstream of the muffler 522 (see Figs. 7 and 8, and paragraphs [0125] and [0126]). Yoshizumi discloses that, with this configuration, oxygen-off gas can be introduced even if no special system is employed (see paragraph [0126]). Further, Yoshizumi discloses that with this configuration, it is possible to simplify the construction and the control logics of the system and reduce the cost (see paragraph [0126]). One of ordinary skill in the art would not have predictably modified Yoshizumi with the teachings of Yamamoto, as proposed by the Office Action, because to do so would complicate the construction of the device and result in increased cost.

Therefore, independent claims 1, 8 and 10, and dependent claims 4-6 and 9, are patentable over the combination of Yoshizumi and Yamamoto. Accordingly, it is respectfully requested that the rejection be withdrawn.

The Office Action rejects claims 1, 2, 4-6 and 8-10 under 35 U.S.C. §103(a) over Yoshizumi in view of Yamamoto, and further in view of U.S. Patent Application Publication No. 2003/0022031 A1 to Manery. The rejection is respectfully traversed.

Yoshizumi and Yamamoto would not have rendered obvious the features of independent claims 1, 8 and 10 for the same reasons as discussed above. The Office Action cites Manery as allegedly disclosing a "voltage sensing system." Manery discloses a fuel cell

system for switching electronic monitoring and control circuitry between power sources such as a battery and a fuel stack (see paragraph [0007]). Manery discloses that when a purge cell voltage sensor S4 detects a performance drop below a threshold level in a purge cell portion 36, a microcontroller 40 causes a purge to occur through purge valve 70 (see paragraph [0050]). However, like Yoshizumi and Yamamoto, the purge operation in Manery occurs as a result of the normal operation of the fuel cell system. Manery does not disclose an operation of the fuel cell system based on a detected abnormality of purge valve 70.

Therefore, the combination of Yoshizumi, Yamamoto and Manery does not disclose all of the features of independent claims 1, 8 and 10 for at least the above reasons. As such, independent claims 1, 8 and 10, and dependent claims 4-6 and 9, are patentable over the combination of Yoshizumi, Yamamoto and Manery. Accordingly, it is respectfully requested that the rejection be withdrawn.

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1, 4-6 and 8-10 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

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